

REMARKS

Claims 1-7 were rejected under 35 U.S.C. § 112, first paragraph, as not being enabled by the specification. The Examiner makes the following points.

(i) Considering that the claims require the use of an “unshrinkable sleeve”, the specification is said to not clearly describe how a sleeve having an inner diameter which is smaller than the outer diameter of a core is placed onto the core.

(ii) The specification is said to be deficient in terms of teaching one of ordinary skill how to “heat-weld” the unshrinkable sleeve onto the surface of the roller.

Applicants respectfully traverse for the following reasons.

With respect to (i) above, the specification at page 5, lines 16-22 describes that when the unshrinkable sleeve 4 has an inner diameter smaller than the outer diameter of the core roller 3, the core roller 3 is pressed into the sleeve 4 and coated therewith. Although the claims require an “unshrinkable sleeve”, this does not mean that the sleeve cannot be expanded or stretched to fit over a larger-diameter core roller.

With respect to (ii) above, the specification at page 5, line 23 - page 6, line 2 describes that:

“The unshrinkable sleeve 4 may be joined with the core roller 3 through heat-welding; i.e., the sleeve 4 is joined with core roller 3 without application of an adhesive. Therefore, the unshrinkable sleeve 4 is welded onto the core rollers without the intervention of an adhesive layer, and thus efficiency in transfer (i.e., removal or cleaning) of toner can be enhanced.”

Thus, the specification teaches that the unshrinkable sleeve is joined with the core roller by welding, namely, by the application of heat. This is readily understood by one of ordinary skill.

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In Example 1 at page 7, the specification further describes that:

“The core roller was coated with an unshrinkable sleeve having a thickness of 100 μm , a Young’s modulus of 140 MPa, and a surface resistivity of $10^9 \Omega/\square$. The resultant core roller was heated at 162°C for 60 minutes, to thereby heat-weld the sleeve onto the core roller and produce a roller member.”

Thus, the specification clearly teaches one of ordinary skill how to heat-weld the unshrinkable sleeve onto the core roller.

In view of the foregoing, it is respectfully submitted that the present claims are fully enabled by the specification, and withdrawal of the foregoing rejection under 35 U.S.C. § 112, first paragraph, is respectfully requested.

Responsive to the rejection under 35 U.S.C. § 112, second paragraph, claim 1 at line 3 has been amended to replace the term “roller” with “core roller” to provide the appropriate antecedent basis. Withdrawal is respectfully requested.

Claims 1-4 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,717,988 to Jinzai et al. Jinzai et al was cited as teaching a roller member 1 comprising a metallic core 1c roller and an unshrinkable sleeve 1a heat-welded onto the surface of the roller 1c, which sleeve 1a is formed from an elastomer material. Because the offset prevention covered layer 1a of Jinzai et al is said to be made from the same elastic material as that of the “unshrinkable sleeve” of the invention, the Examiner considered that the prior art elastomer would inherently exhibit the claimed Young’s modulus. Furthermore, the Examiner did not consider the process limitation “heat-welded” to be of patentable significance.

Applicants respectfully traverse for the following reasons.

The technical concept underlying the present invention is that, by appropriate selection of a Young's modulus of the sleeve within a predetermined range (i.e., 120-200 MPa), crushing of toner particles is prevented to thereby improve performance for removing toner, or the mechanical strength of the sleeve is improved to thereby enhance durability of the sleeve. In order to exhibit a Young's modulus that falls within this predetermined range, the sleeve must be provided beforehand (i.e., before assembly). Moreover, in order to prevent crushing of toner particles, it is clear that the sleeve must have a certain thickness in consideration of a cushioning effect. Thus, a sleeve designed to have a thickness of 30-200 μm is provided through molding in advance. In contrast, if a coating as disclosed in Jinzai et al were employed, attaining such a thickness would be very difficult. In fact, in the embodiment of Jinzai et al, the thickness of the sleeve was 10 μm or thereabouts (col. 3, lines 49-51).

Thus, to clearly distinguish the present invention from Jinzai et al, claim 1 has been amended to recite that (i) the core roller is pressed into the unshrinkable sleeve and the sleeve is heat-welded onto the surface of the core roller. Thus, the sleeve is provided in advance, meaning that the sleeve is ready when press-fitting is carried out. Claim 1 has also been amended (ii) to incorporate therein the recitation of claim 6, namely, a thickness of 30-200 μm of the unshrinkable sleeve. The function and effect obtained by establishing the thickness of the unshrinkable sleeve at 30-200 μm is understood from the description in the specification at page 4, lines 25-27. Specifically, this passage of the specification describes that when the unshrinkable sleeve has an excessively high Young's modulus, toner particles are crushed, but when the Young's modulus falls within a predetermined range, no such problem arises. Thus, in consideration of the description in the specification, it is evident that the sleeve must have a

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certain specific thickness, which is the thickness range of 30-200 μm as claimed. As acknowledged by the Examiner, the feature of claim 6 as incorporated into claim 1 is not disclosed by Jinzai et al.

In view of the amendments to claim 1 and the above remarks, it is submitted that the present claims are not anticipated by Jinzai et al, and withdrawal of the foregoing rejection under 35 U.S.C. § 102(b) is respectfully requested.

Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Jinzai et al in view of U.S. Patent 6,117,257 to Takahashi et al. Takahashi et al was cited as teaching a surface roughness of 5 μm or less, citing col. 5, lines 61-62.

Applicants rely on the response above with respect to the rejection of claims 1-4 over Jinzai et al alone. Additionally, Takahashi et al likewise fails to disclose a sleeve thickness of 30-200 μm as claimed, or the advantages of the claimed thickness as discussed above.

Withdrawal of the foregoing rejection is respectfully requested.

Claim 6 was ejected under 35 U.S.C. § 103(a) as being unpatentable over Jinzai et al. The Examiner considered that the selection of a thickness of the unshrinkable sleeve of from 30 - 200 μm would have been an obvious matter of design choice.

Applicants traverse, especially considering that Jinzai et al specifically teaches an offset prevention covered layer 1a having a thickness of about 10 μm , and is silent with respect to the significance of the thickness of the offset prevention covered layer. Also, there is nothing in Jinzai et al to suggest increasing the thickness of the offset prevention covered layer.

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Additionally, Applicants dispute "official notice" that use of a sleeve thickness between 30-200 μm is well known in the art. Applicants request the Examiner to supply a reference in support of his position.

Withdrawal of the foregoing rejection is respectfully requested.

Claims 1-3 and 5-7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,515,757 to O'Connor et al in view of Takahashi et al. O'Connor et al was cited as teaching a roller member (anvil roll for use in a rotary die cutter) having a metallic core 11 and an unshrinkable sleeve 20 provided on the surface of the roller, which sleeve 20 is formed from an elastomer material, citing col. 6, line 56. Takahashi et al was cited as teaching an elastomeric material for use as a sleeve made up a fluorine resin (PFA) tube. The reason for rejection was that it would have been obvious to employ the elastomeric material of Takahashi et al for the sleeve of O'Connor et al with the reasonable expectation of providing an elastomeric material that can be easily fastened to the core roller.

Applicants respectfully traverse for the following reasons.

Claim 1 has been amended to incorporate therein the recitation of claim 6, to recite that the unshrinkable sleeve has a thickness of 30-200 μm . Neither O'Connor nor Takahashi et al disclose a sleeve thickness of 30-200 μm as claimed, or suggest the desirability and/or effects of having a sleeve thickness of 30-200 μm . Therefore, Applicants submit that amended claim 1 is patentable over O'Connor et al in view of Takahashi et al, and withdrawal of the foregoing rejection under 35 U.S.C. § 103(a) is respectfully requested.

Withdrawal of all rejections and allowance of claims 1-5 and 7 is earnestly solicited.


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In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claim 6 is canceled.

The claims are amended as follows:

1. (Amended) A roller member comprising a metallic core roller and an unshrinkable sleeve [which],wherein the core roller is pressed into the unshrinkable sleeve and the sleeve is heat-welded onto the surface of the core roller, which sleeve is formed from an elastomer material and has a Young's modulus of 120-200 MPa and a thickness of 30-200 μ m.